Product information

Vmax™ X2 chemically competent cells

Component	Cat. no. CL1300-05	Cat. no. CL1300-10	Cat. no. CL1300-20	Volume	Storage temperature
	Quantity				
Vmax™ X2 chemically competent cells	5 vials	10 vials	20 vials	50 µL/vial	–80 ˚C
Vmax™ recovery media	1 bottle	1 bottle	2 bottles	10 mL/bottle	Room temperature
Positive control pACYC/ chlor plasmid	1 vial	1 vial	1 vial	25 µL at 5 ng/µL	–20 ˚C

Accessory products

- Vmax™ X2 enriched growth medium (Telesis Bio cat. no. CL1500-1000)
- Vmax™ recovery media (Telesis Bio cat. no. CL1520-10, CL1520-6X10)

Guidance and recommendations

- Cells are shipped on dry ice. Upon receipt, store immediately at –80 °C and protect cells from temperature fluctuations.
- Use competent cells within six months of receipt.
- Thaw Vmax™ X2 chemically competent cells on ice just prior to use.
- If cells need to be re-suspended, do so by gently flicking the tubes. Do not vortex or pipette up and down.
- Only use the provided Vmax™ recovery media for recovery after transformation. Do not use SOC or other recovery media.
- Pre-warm recovery media to 37 °C prior to use.
- Store transformed Vmax™ X2 plates at room temperature for at least ten days, during which time colonies may be used for inoculation and/or re-streaking onto fresh plates.
- Store Vmax™ X2 enriched growth medium at room temperature and add antibiotics on an as-needed basis.
- Neither plates nor liquid cultures should be stored at 4 °C.
- For long-term storage prepare glycerol stocks and store at –80 °C.

Overview

Vmax™ X2 chemically competent cells

Vmax™ X2 chemically competent cells are an engineered *Vibrio natriegens* strain containing a major extracellular nuclease knockout and insertion of an IPTG-inducible T7 RNA polymerase cassette for expression of genes under a tightly controlled, inducible T7 promoter. A high transformation efficiency of over 1 x 10^7 CFU/µg DNA, robust expression system, and extremely fast growth rate make Vmax™ X2 cells ideal for replacing traditional alternative strains in most protein expression workflows.

Introduction

Vmax™ X2 is a novel bacterial strain and next-generation platform for recombinant protein expression. The Vmax™ X2 system is designed for fast growth and high protein yields using plasmids and workflows used for *E. coli*. Unlike other commonly used prokaryotic recombinant protein expression systems, the Vmax™ X2 strain is derived from the marine microorganism, *Vibrio natriegens*[1,2]. This gram-negative, non-pathogenic bacterium exhibits the fastest growth rate of any known organism with a doubling time of less than 14 minutes, a growth rate that is twice as fast as that of *E. coli*[3].

The extremely fast growth rate of Vmax™ X2 cells provide important flexibility for demanding research environments, it responds well to a variety of nutrients and media, and it can outgrow *E. coli* and other protein expression systems at a range of temperatures (25 °C to 37 °C)[4,5]. This provides the opportunity to fine-tune protein expression rapidly under a variety of conditions at a smaller scale, then transition to large-scale production and purification.

To allow the seamless transfer of your *E. coli*-based expression constructs, Vmax™ X2 cells are compatible with a variety of commonly used protein expression vectors. This includes the pET-derived series of vectors that use the phage T7 expression system regulated by the addition of isopropyl β-D-1-thiogalactopyranoside (IPTG). High transformation efficiencies also rival the best alternative bacterial expression strains with 1 x 10^7 colonies formed per µg DNA, allowing for an easy switch to the Vmax™ X2 workflow.

Similar to other historically used bacterial expression strains such as *E. coli* BL21(DE3), Vmax™ X2 cells can be cultured with routine growth medium such as Luria broth (LB) supplemented with salt, 2xYT, Terrific broth (TB), and other commercial auto-inducible media. However, we recommend our animal component-free, optimized Vmax™ X2 enriched growth medium for best results.

Unlike *E. coli*, induction of expression in Vmax™ X2 is largely independent of growth phase and has been performed at a wide variety OD_{600} of readings (0.1 to 1). Protein expression induced over this range remains stable overnight with no negative impacts on protein yield. This flexibility in induction time reduces the need to closely monitor cell culture growth. Other advantages of Vmax™ X2 include:

- Typical protein yields are twofold to fourfold higher than *E. coli*, due to Vmax™ X2 having a high biomass production and speed of growth.
- Efficient protein production with no restrictions on an optimal harvest point within a 4-to-24 hour period.
- A 100-fold reduction in endotoxin levels as compared to traditional *E. coli* strains.
- Figure 1 depicts the workflow comparison of *E. coli* and Vmax™ X2.